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The citizen scientific method: tapping a human natural resource in ecosystem restoration

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Vashon Nature Center

The Salish Sea is in trouble

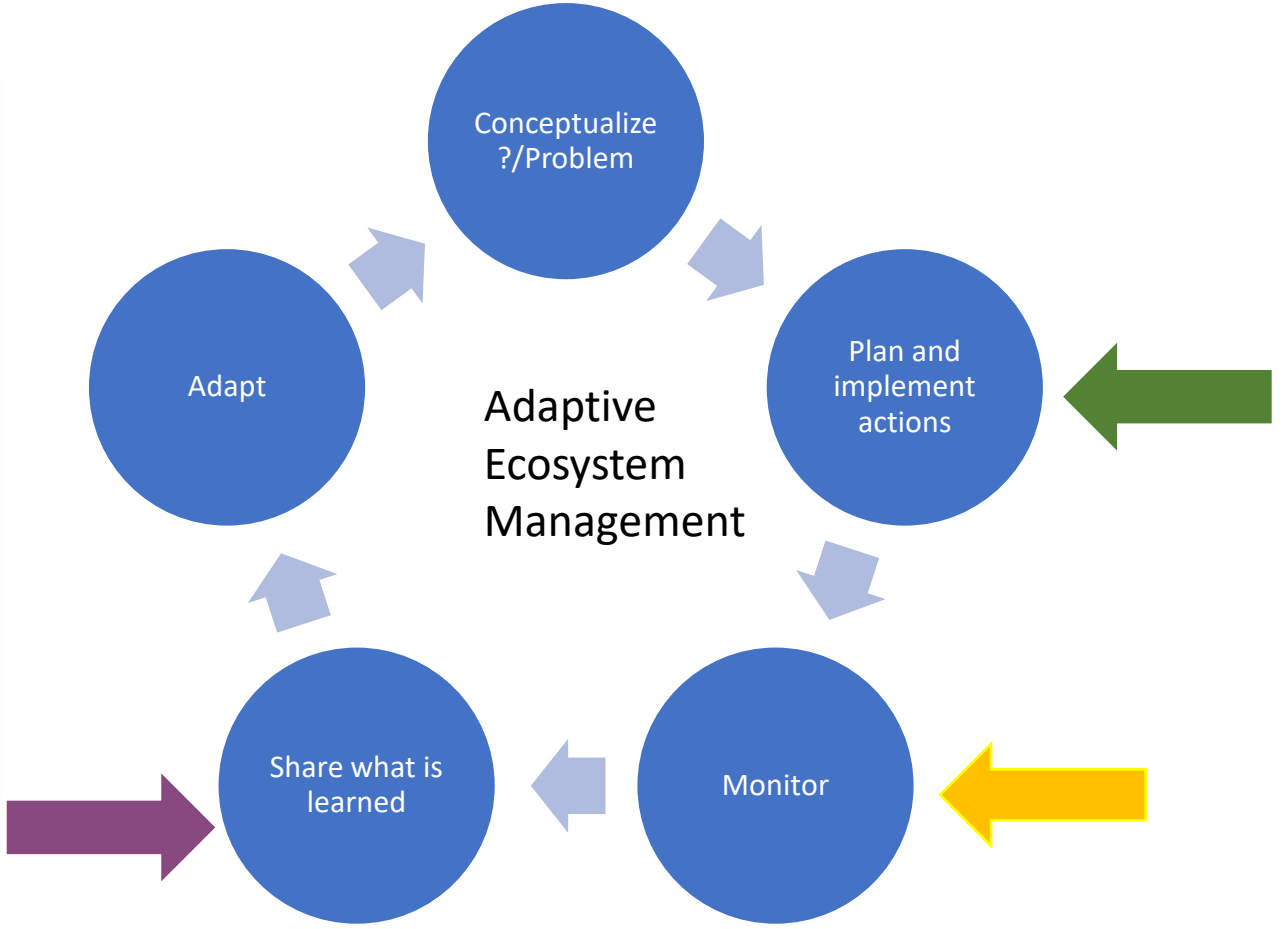
- Salmon populations at 6-7% compared to 140 years ago (Gaydos and Benedict 2018)
- 1/3 of marine birds listed as threatened, endangered or candidates (Vilchis et al. 2014)
- Resident Orca whale population critical (NOAA 2004)
- Of 50 measurable Vital signs indicators used by the Puget Sound Partnership, 10 show improvement (psp.wa.gov)
- Of 10 indices of health used by EPA/Env Canada, 7 are decreasing or not improving.

Photos by: Kelly Keenan

Why citizen science?

- Ability to increase the amount of data collected over space and time (Theobald et al. 2005)
- Increased environmental literacy (Trombulak et al. 2004)
- Environmental Ambassadors/development of a conservation ethic (Horwitz 1996, Haywood et al. 2016)
- Engagement in citizen science leads to positive change in actions for volunteers (Jordan et al. 2011)
- Need for more research that measures direct links between citizen science programs and improvements in ecosystem health and management (Conrad and Hilchey 2011; McKinley et al. 2017)

Explore links between citizen science and local ecosystem restoration in three different programs



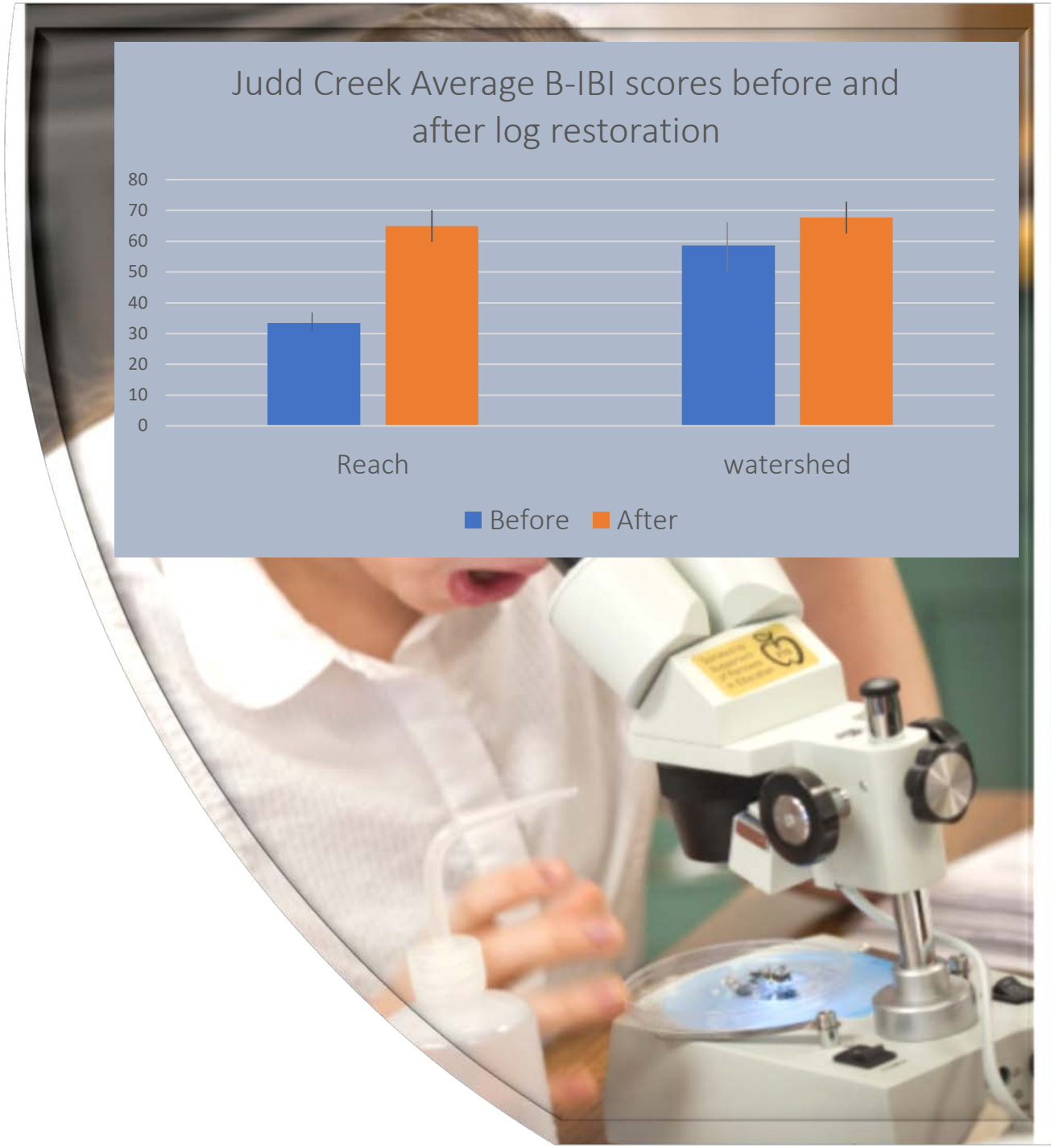
Public participation in the adaptive process is essential yet hard to cultivate authentically. Shultz et al. 2015

BioBlitz

- **Main Question:** How many species do typical island habitats support?
- **Tie to management cycles:** weak
- **Results:** 1092 species recorded in 5 events
- **Measurable ecological or management impact:** species lists integrated into Maury Island Aquatic Reserve Management Plan, used for local conservation efforts. No direct measurable impacts on ecosystem condition.
- **Challenges:** Data management, storage

Stream Team

- **Main Questions:** What stressors are impacting local creeks? Does log restoration work?
- **Tie to management cycle:** Strong, local
- **Results:** Shinglemill creek may be experiencing impact from high flows and stormwater. Log restoration improves stream condition at the reach level.
- **Measurable ecological or management impact:** Stormwater control projects initiated, log restoration expanded.
- **Challenges:** Balancing management goals and educational standards.
- **Fortuitous stumbling:** New genus of isopod for Washington discovered by 6th graders.



BeachNET

- **Main Questions:** where and when do forage fish spawn? What happens to beach ecology when bulkheads are removed?
- **Tie to management cycle:** Strong, multiple scales
- **Results:** Clear differences between bulkheaded and natural sites—see Kirsten Miller, 2018 SSEC poster.
- **Measurable ecological or management impact:** neighbor support, partnership network, Forage fish data integrated into DNR/WDFW databases.
- **Challenges:** integrating across spatial scales and partners, long-term capacity

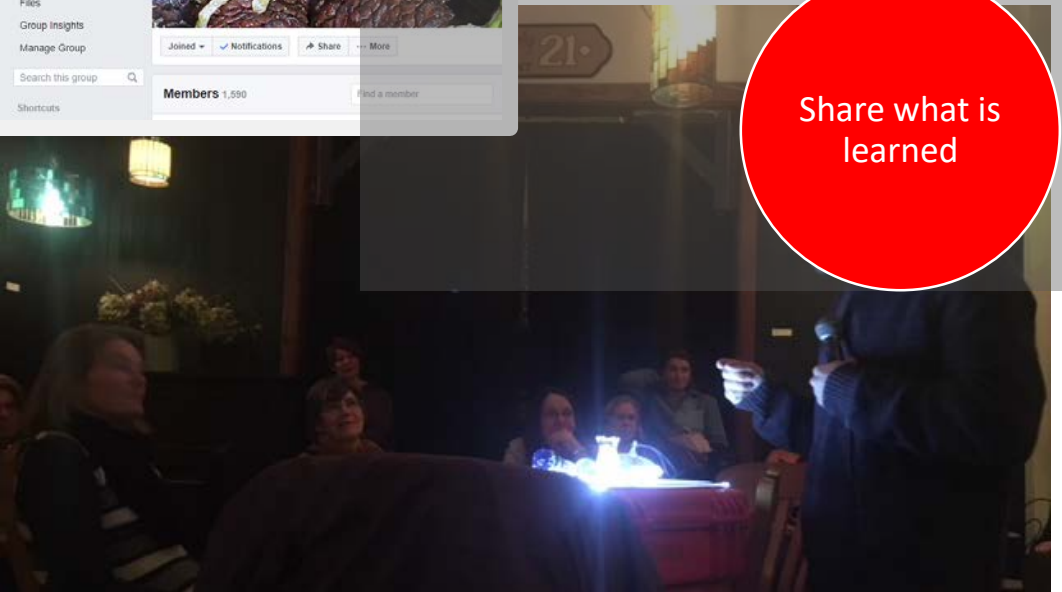
Conceptualize ?/Problem

Plan and implement actions

Monitor

Share what is learned

Adapt



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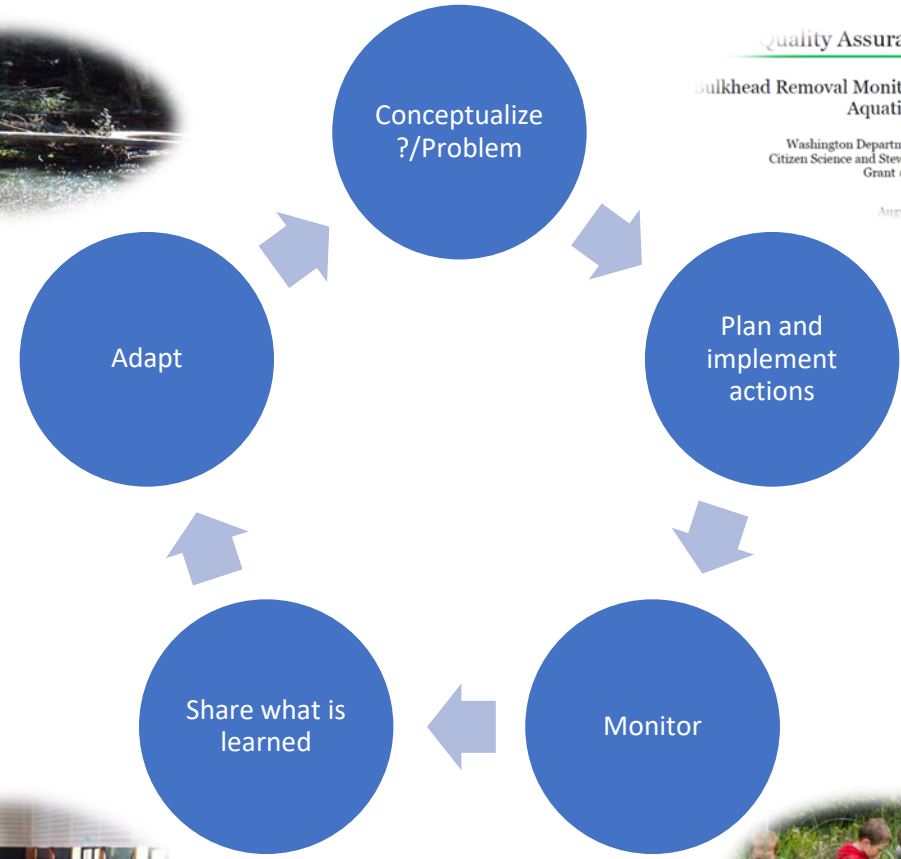
Summary

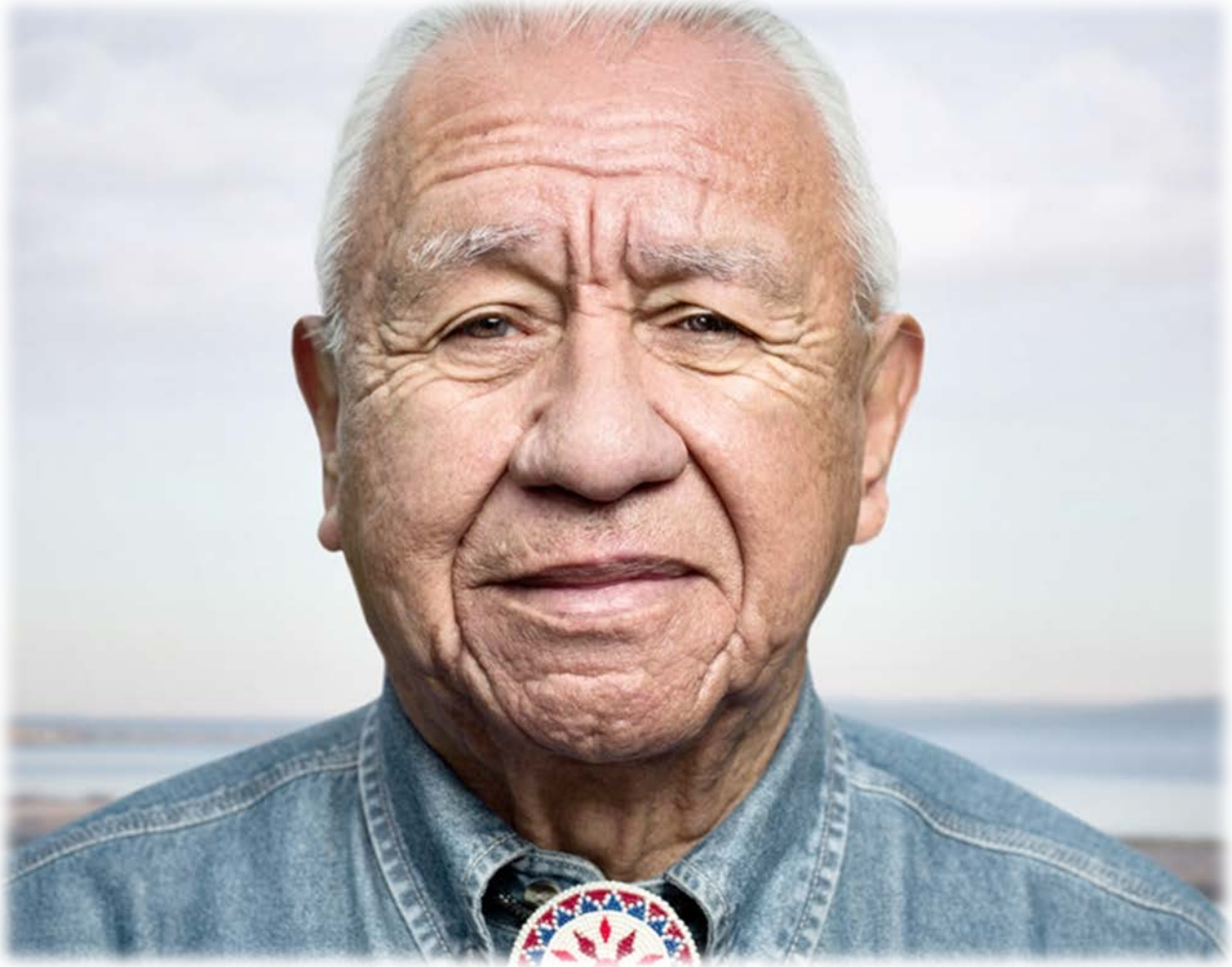
- Citizen science as community science
- Tying to adaptive management cycle provides more direct change and a framework for monitoring effectiveness
- Partnerships across multiple scales increases success
- Treat information gathered as natural heritage. Share creatively.



The demographics of citizen science volunteers do not reflect the demographics of the US (Pandya 2012)

“We should involve people in saving the Salish Sea…we need to point the canoe in a different direction … paddle together in a way that is intelligent and efficient and we need to paddle hard.”

Billy Frank Jr. Puget Sound Georgia Basin Ecosystem Conference, 2009



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